



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application Serial No.09/421,625
Filing Date October 19, 1999
Inventor..... E. Marsh
AssigneeMicron Technology, Inc.
Group Art Unit 2811
Examiner H. Vu
Attorney's Docket No. MI22-1284
Customer No. 021567
Title: Circuitry and Capacitors Comprising Roughened Platinum Layers

**DECLARATION OF PRIOR INVENTION IN THE UNITED STATES TO
OVERCOME CITED PATENT UNDER 37 CFR 1.131**

To: Commissioner for Patents
PO Box 1450
Art Unit 2811
Alexandria, VA 22313-1450

From: James E. Lake (Tel. 509-624-4276; Fax 509-838-3424)
Wells St. John P.S.
601 W. First Avenue, Suite 1300
Spokane, WA 99201-3828

PURPOSE OF DECLARATION

This declaration is to establish completion by actual reduction to practice of the inventions in claims 110-116 of the present application in the United States, at a date prior to December 16, 1997, that is the effective date of the prior art U. S. Patent No. 6,033,953, issued to Aoki, that was cited by the Examiner.

The person making this declaration is the inventor.

EL979977245

FACTS AND DOCUMENTARY EVIDENCE

To establish the date of completion of the inventions set forth in claims 110-116 of the present application, the following attached documents are submitted as evidence: Pages 1-5 of Invention Disclosure No. 97-1270 (dates redacted) including photocopies of two photomicrographs.

From these documents, it can be seen that the inventor reduced to practice the inventions set forth in claims 110-116 of this application. The undersigned inventor declares that such reduction to practice occurred prior to the December 16, 1997 effective date of the Aoki reference.

In particular, claim 110 sets forth an integrated circuit that includes, among other features, a hemispherical grain platinum layer with a continuous surface and characterized by columnar pedestals with an average diameter of at least about 200 Angstroms. Figure 1 of the Invention Disclosure is identical to Fig. 4 in the present application and its details are described in the present specification at least at page 11, line 19 to page 13, line 10, which text is herein incorporated by reference. Also, Fig. 4 (Figure 1) provides a legend indicating a relative length of "100 nm" (nanometers) that is equivalent to 1000 Angstroms. As is readily apparent, Fig. 4 (Figure 1) shows the claim 110 platinum layer having columnar pedestals with an average diameter of at least about 200 Angstroms. It is also apparent, that section 2.2 on page 1 of the Invention Disclosure inherently describes use of the layer in an integrated circuit. Claim 110 also sets forth an intervening layer. Section 2.2 discusses an intervening layer as a "Pt under-layer."



TIME OF PRESENTATION OF THE DECLARATION

This declaration is submitted prior to final rejection.

DECLARATION

As a person signing below:

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Marsh, Eugene P.

Inventor's signature

A handwritten signature in cursive script, appearing to read "Eugene P. Marsh", written over a horizontal line.

Date:

1/13/04

Country of
Citizenship:

U.S.A.

Residence:

Boise, Idaho

Post Office Address:

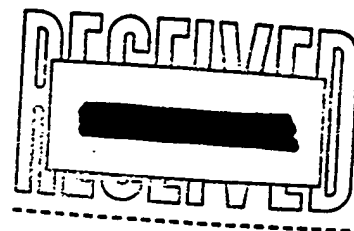
1722 Picabo Court

Boise, Idaho 83716

If ARPA project,
please check below:

INVENTION DISCLOSURE

97-270



- ☐ Advanced SRAM
- ☐ BST
- ☐ FED
- ☐ FE RAM
- ☐ NCAICM

1. INVENTOR(s) Eugene P. Marsh

2. DESCRIPTION

2.1 Title of invention: hemispherical grain platinum for high surface area Pt applications.

2.2 Brief description: Pt is one of the candidates for use as an electrode for high dielectric capacitors. High surface area HSG Si electrodes have proven effective in increasing the cell capacitance for a given electrode area. This should also be true of a rough Pt electrode if the surface could be structured to produce smooth high area features without producing sharp points. Such a film could also find applications in the development of high surface area catalyst materials.

I propose a patent application using CVD deposition to deposit hemispherical grain Pt surfaces for high surface area applications. Figure 1 and 2 show SEM micrographs of Pt films produced by the CVD deposition of $\text{MeCpPt}(\text{Me})_3$. Figure 1 and photo show a hemispherical grain surface, where the individual grains appear to be smooth. Figure 2 shows a fine grain Pt surface. This indicates that it is possible to control the grain structure of the films via the process parameters to deposit a film with smooth hemispherical grains. It should also be possible to grow such a film on a smooth Pt under-layer if required.

2.3 Also attach a complete description, including drawings or sketches and articles relevant to the invention. Legible photocopies of laboratory notebooks are acceptable. Two figures and a polaroid are attached.-

3. INFORMATION CONCERNING CONCEPTION OF INVENTION

3.1 CONCEPTION AND DOCUMENTATION OF THE INVENTION

a. Identify the date when you first conceived the invention. (If not sure, give the earliest date of which you are sure.)

[REDACTED]

b. To whom was the idea first described and on what date? (Other than a co-inventor.)
Don Westmoreland

c. Identify the date of the first tangible record such as computer simulation, tape out, drawing or written description. Please specify type and location. SEM micrograph [REDACTED]

3.2 CONCEPTION OF THE INVENTION

- a. Please identify related invention disclosures, patents or other publications describing similar ideas, and other companies working in the same field. Attach copies, if available.
unknown

- b. What is the closest technology, of which you are aware? Deposition of Pt onto high surface area catalyst beds is common.

Identify the advantages of this invention over previous technology. The invention would provide conformal high surface area Pt films. This could increase cell capacitance in high dielectric capacitor or increase efficiency of Pt surface catalysis.

3.3 IMPORTANT DATES

- a. Has the invention been disclosed outside the company? No
If yes, to whom, when, and in what form?
- b. Have any articles describing your invention been published?
 If yes, list author(s), title of article, publication
and date. No
- c. Have any engineering samples been given out? No If yes, to
whom and on what date?
- d. Has any product using the invention been sold or offered for
sale? No If yes, to whom and on what date?



3.4 DISPOSITION OF THE INVENTION

a. When will (or did) Micron begin use of the invention experimentally? Micron Synthesis Lab
[REDACTED]

b. When will (or did) Micron begin production of this invention? Unknown

3.5 MISCELLANEOUS INFORMATION

a. Was the invention developed during a joint development agreement or other contract with an outside company?
No

b. Please list developmental work outside of the company (including Government proposal or contract).

4. INVENTORS:

363-1026

Name: Eugene P Marsh

Micron Phone: ~~83310~~ 31026 Micron Mail Stop: 632

Company Name(VERY IMPORTANT): Dept. Name: Micron Synthesis Lab
X Micron Technology, Inc. Dept. #: 857
____ Micron Computer, Inc.
____ Micron Custom Manufacturing Services, Inc.
____ Micron Display Technology, Inc.
____ Micron Communications, Inc.
____ Other _____

Home Address: 1722 Picabo Ct, Boise ID. 83716

Citizenship: _U.S._

Supervisor: _Don Westmoreland_

Signature: Eugene Marsh Date: [REDACTED]

TECHNOLOGY CENTER 2800

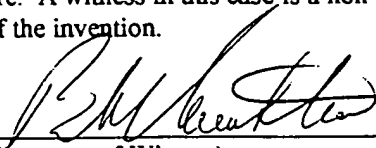
JAN 29 2004

RECEIVED



WITNESS

If there is only one inventor, a witness should sign and date this disclosure. A witness in this case is a non-inventor who understands the nature of the invention.


(Signature of Witness)



(Date)

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JAN 23 2004
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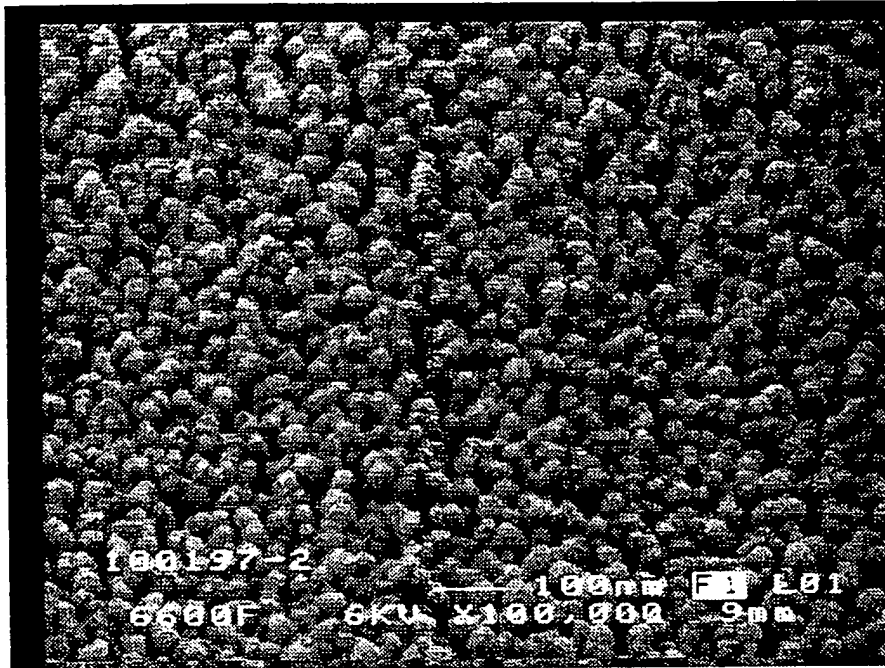


Figure 1. SEM showing smooth hemispherical grain.



Figure 2. SEM showing fine grains.